

# Development of the Hanford Site Profile

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# Purpose of Meeting

- We will discuss the Hanford Site Profile.
- We will describe how the Site Profile is used.
- We are asking you for your suggestions and information.
- We want to document your concerns and issues.
- We want to answer your questions.

Energy Employees

Occupational Illness

Compensation Program Act

(EEOICPA)

Department of Labor

Department of Health  
and Human Services – NIOSH

Oak Ridge Associated  
Universities Team

# ORAU TEAM Program Goals

- We will protect the claimant's privacy.
- We want to process claims accurately, fairly and efficiently.
- We want to work with you to get your input and comments on our work on this project.
- We will avoid conflicts of interest.

Dose

Reconstruction

# Occupational Radiation Dose

Occupational Medical Dose

Occupational Environmental Dose

Internal Dose

External Dose

# Site Profiles

Site Profile documents contain information about the activities and practices at a given Site, focusing on the radiation protection practices.



# Site Profile

The Site Profile provides information on:

- Potential radiation exposures
- Radiation sources
- Radiation dosimetry program

# Site Profiles

- The larger Site Profile documents contain six Technical Basis Documents (TBDs) that focus on specific topic areas.
- The Site Profile and the TBD provide technical guidance to prepare dose reconstructions.

# Site Profile

- These are living documents that can be revised when additional information is obtained.
- These documents assist NIOSH in completing the work required for each dose reconstruction.

# Site Profiles

We use the word “facility” as a general term for an area, building, or group of buildings that had a specific purpose at a site.

“Facility” does not necessarily mean or refer to an "atomic weapons employer facility" or "Department of Energy facility" as defined in the Act.

# Site Profiles Support Dose Reconstruction

- Used by health physicists in reconstructing doses.
- Provide site-specific technical information.
- Minimize interpretation of data.
- Are living documents.

# General Information

- NIOSH wants your input. You should send your comments directly to NIOSH.
- We are meeting with union representatives at all sites to encourage input.
- You can see the completed Site Profiles at <http://www.cdc.gov/niosh/ocas/ocastbds.html> .

# Developing the Site Profile

- The TBDs are written by subject experts.
- Every TBD is reviewed by NIOSH and the ORAU Team.
- Every TBD is approved by NIOSH and the ORAU Team.

# Developing the Site Profile

- Hanford Site Profile team was established in April 2003.
- The Team Leader is Ed Scalsky.
- The TBDs were written by different authors.
- The Site Profile (Rev00) was approved on October 15, 2003.
- Some TBD revisions are completed; others are in progress.



# Contents of Site Profile

- Purpose and Scope
- Site Description
- Occupational Medical Dose
- Occupational Environmental Dose
- Occupational Internal Dosimetry
- Occupational External Dosimetry

# Purpose and Scope

## The Site Profile:

- Is used to reconstruct radiation doses to workers at the Hanford Site.
- Covers the time from 1942 to the present.
- Uses claimant-favorable assumptions.

# Site Description

- Briefly describes the facilities and processes at the site over the years.
- Lists the radioactive materials and radiation sources present.
- Identifies potential internal exposures.
- Identifies potential external exposures.

# Portsmouth Gaseous Diffusion Plant

- Reactors – nine production, seven R&D
- Chemical separations – REDOX, PUREX
- Fuel fabrication
- Waste handling
- Radionuclides – plutonium, uranium, thorium, neptunium, tritium, fission products

# Occupational Medical Dose (X-rays)

- How often were chest X-rays taken?
- What equipment and techniques were used?
- What was the radiation dose to specific organs?
- How should this information be used to reconstruct the radiation dose?

# Occupational X-ray Dose

- Only X-rays required by the employer are included.
- Annual chest X-rays through 1959.
- X-ray equipment used changed over time.
- Older equipment gave off more X-ray.
- This radiation dose is not included in the worker's DOE dose record.

# Occupational Environmental Dose (for workers who were not monitored)

Workers who are not radiation workers (badged) can be exposed to radiation from:

- Radioactive materials in the air.
- Radiation sources in buildings.
- Radioactive materials in the work environment.

# Occupational Environmental Dose (for Unmonitored Workers)

- Radiation dose inside the body from radioactive materials that are in the air the worker breathes.
  - Releases to air on the site.



# Occupational Environmental Dose (for Unmonitored Workers)

Radiation dose from radioactive materials that are outside the worker's body but are in the worker's environment.

- Radiation sources in buildings.
- Radioactive materials in storage areas, waste pits, etc.
- Radioactive materials on the ground and on other surfaces.
- Submersion in a radioactive cloud – argon-41

# Occupational Environmental Dose

## (for Unmonitored Workers)

- Internal radiation dose
  - Calculate the amount of radioactive material taken into the body from the concentration in the air.
  - Calculate the radiation dose to specific organs.
- External radiation dose
  - Calculate the radiation dose to the whole body from radiation sources that are outside of the body.
  - Calculate the radiation dose to specific organs.

# Occupational Environmental Dose

(for Unmonitored Workers)

- Provides instructions for reconstructing doses.
- This environmental dose is not included in the worker's DOE dose record.

# Occupational Internal Dosimetry

- Methods and practices
- Sources of exposure
- Minimum detectable activity (MDA) for:
  - Whole Body Counting
  - Urinalysis
- Reporting levels
- Instructions for reconstructing dose

# Internal Dosimetry

- Bioassay program started in 1947.
- Urine was tested for plutonium, americium, curium, tritium, uranium, strontium, promethium, polonium, neptunium, FP.
- Measured gamma-emitting radioactive materials inside the body

Thyroid counter - 1956

Whole body counter – 1959

Chest counter – 1967

# Occupational External Dosimetry

- Methods and practices
- Sources of exposure
- Adjustments to recorded dose
- Minimum detectable levels (MDLs)
- Instructions for reconstructing dose

# External Dosimetry

- Dosimeter technology
  - Beta/photon – 1944 to present
  - Neutron – prior to 1950 to present
- Calibration procedures
- Exchange frequency
- Workplace radiation fields
- Exposure geometry

# In Conclusion

- Developing a usable Site Profile is an important task.
- Site Profiles are living documents.
- Additional information is being sought and will be used when it adds to the document.
- Send comments directly to NIOSH.



# Sending Comments to NIOSH on Site Profile Documents

- NIOSH welcomes comments from all interested stakeholders (organized labor groups, worker advocacy groups, claimants, etc.) on the Site Profile documents.
- Please include the name of the site, the title of the document, and the Site Profile number (Hanford Site Profile; ORAUT-TKBS-0006) when submitting comments.

# Sending Comments to NIOSH on Site Profile Documents

Send all comments to:

Department of Health and Human Services  
National Institute for Occupational  
Safety and Health (NIOSH)

Robert A. Taft Laboratories      MS-C34

4676 Columbia Parkway

Cincinnati, OH 45226

Fax: (513) 533-8230

email: [siteprofile@cdc.gov](mailto:siteprofile@cdc.gov)

# NIOSH Website

You can find information about the NIOSH Office of Compensation Analysis and Support (OCAS) and the EEOICPA at their website <http://www.cdc.gov/niosh/ocas/> .